

<b>JSA NUMBER:</b> JSA-013 <b>ORIGINAL:</b> 11/01/05 <b>REVISION:</b> 2/23/07	<b>Revision No:</b> 1	<b>Company Performing the Job:</b> Brown and Caldwell / Subcontractors	<b>PROJECT MANAGER:</b> Chuck Zimmerman <b>SAFETY OFFICER:</b> Penny Bassett
<b>JOB TITLE OR TASK:</b>  Well Development	<b>TITLE OF PERSON(S) WHO PERFORMS JOB:</b> Field Manager: TBD Field Technicians: TBD	<b>ANALYSIS BY:</b> Penny Bassett <b>REVIEWED BY:</b> Chris Gardener	
<b>REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE) AND/OR PERTINENT JOB SAFETY FORMS:</b> <i>Minimum PPE:</i> Hard hat, safety glasses, steel-toed boots, long-sleeved shirt, high visibility vest. <i>Additional PPE (as needed):</i> Leather gloves, nitrile gloves, face shield. <i>Monitoring Equipment:</i> water level indicator <i>Job Safety Form:</i> BP Authorization to Work, Tailgate Meeting Record			

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	PREVENTIVE OR CORRECTIVE ACTION
1. Pre-Construction Safety Meeting.		1. All employees assigned to this task will attend a pre-construction safety meeting, which will include the pertinent JSAs, Standard Operating Procedures, types of potential hazards, and actual hazards present and controls for those hazards.
2. Drill location setup of development rig <ul style="list-style-type: none"> <li>a. Back development rig to well head.</li> <li>b. Raise mast</li> </ul>	1. Visitor mishaps and resulting bodily injury.  2. Striking overhead lines or objects with drill mast.	1. Pay attention to visitors approaching work area. If necessary, setup barriers to keep vehicles and visitors out of the work area and use caution tape if available. 2. Observe overhead lines, tree limbs, or other objects before raising the mast of the drill rig. Anticipate the radius of sweep going up and coming down, and plan appropriately.
3. Bail sediment from well <ul style="list-style-type: none"> <li>a. Connect bailing tool to cable and lower to bottom of well.</li> <li>b. Raise bailer to the surface and remove from well.</li> <li>c. Open check ball at bottom of bailer to release collected water and sediment.</li> <li>d. Repeat.</li> </ul>	1. Entanglement or contact with bailer or cable.  2. Contact with contaminated ground water.  3. Exposure to vehicle exhaust fumes when working near back of development rig.	1. Be aware of cable motion. Stand clear as cable raises or lowers in well. Wear gloves when handling cable or bailer. Wear hard hat at all times. 2. If groundwater is known to be contaminated or potentially hazardous (i.e. low pH), water proof gloves and goggles should be worn, wash any body part the contacts the water immediately and thoroughly, irrigate eye with clean water 3. Exhaust exits the development rig (which must be left running) from the rear passenger side at ground level. Avoid standing near exhaust pipe for extended periods of time, try to position yourself upwind. If possible, extend the exhaust pipe with flexible ducting to discharge further from work area.
4. Swab well screen <ul style="list-style-type: none"> <li>a. Connect swabbing tool to cable and lower to bottom of well.</li> <li>b. Raise and lower swab several times at depth of well screen.</li> </ul>	1. Entanglement or contact with swab tool or cable	1. Same as above.

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SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	PREVENTIVE OR CORRECTIVE ACTION
5. Purge water from well <ol style="list-style-type: none"><li>Connect pump to cable and lower to bottom of well.</li><li>Connect pump electrical cable to controller, turn on and adjust to desired pump rate.</li><li>Locate discharge tubing away from work area or collect in a portable tank</li></ol>	<ol style="list-style-type: none"><li>Injury to hearing from noise.</li><li>Back strain and pinch points while placing submersible pump in or out of well.</li><li>Contact with contaminated or harmful water.</li></ol>	<ol style="list-style-type: none"><li>Wear approved safety ear plugs when working close enough to drill rig that you have to speak louder than your normal voice to someone standing next to you.</li><li>Get assistance when handling pump. Use proper lifting techniques. Wear gloves and hard hat</li><li>If groundwater is known to be contaminated or potentially hazardous (i.e. low pH), water proof gloves and goggles should be worn, wash any body part the contacts the water immediately and thoroughly, irrigate eye with clean water</li></ol>

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6. Decontaminate pump and equipment	1. Burns or penetration injuries from high pressure steam cleaner.	1. Wear insulated rubber gloves when using steam cleaner. Never point spray nozzle at yourself or another person when in operation. Do not clean boots or other PPE with steam cleaner while equipment is being worn.
7. Dump collected purge water in identified disposal location a. Move portable tank to disposal location. b. Attach discharge hose from tank to disposal point. c. Open valve. d. When done, close valve and drain hose completely.	1. Driving hazard if dumping into a pond; requires driving close to the embankment. 2. Slipping hazard walking on pond liner when handling discharge hose. 3. Contact with contaminated or harmful water.	1. Use a spotter if possible; park in an area with a protective berm to prevent accidental rolling into pond. 2. Avoid walking on liner, stand on soil area 3. Wear latex or rubber gloves when handling hose and opening valves.
8. Maintenance of drill rig or heavy machinery.	1. Physical hazards associated with use of hand tools to tighten or loosen machinery parts.  2. Physical hazards associated with manual lifting and carrying of machinery parts. 3. Physical hazards associated with moving or falling parts.  4. Eye injury from ejection of hydraulic fluid from machinery lines. 5. Burns from hot machinery parts.	1. Maintain hand tools in proper working condition. Use the correct tool for the task. Avoid “knuckle-banging” (i.e., pay attention to direction of torqued tool slips) and wear leather gloves when possible. 2. Lift heavy objects using the legs and not the back. Use wheeled transport equipment for heavy loads. 3. Keep hands away from potential pinch points during handling. Wear steel toe boots. 4. Wear protective eye goggles or face shield. 5. If unsure, test machinery parts with small amount of water. If parts are hot, allow or cause them to cool before working around them.
9. All Activities	1. Slips, Trips, and Falls	1. All personnel should be constantly watching for trip hazards such as uneven terrain, holes, ditches, stretched wires or ropes, or any other materials or pieces of equipment in their path. 2. Significant below-grade hazards (e.g., holes or trenches) should be marked with flagging, fencing or other appropriate means to make the obstacle easily identifiable. 3. Wear footwear appropriate for the terrain and work to be performed 4. Muddy, snowy, and icy conditions will warrant a more cautious work attitude. Employees should change work speed and style to fit the weather conditions.
10. All Activities	1. Back, hand, or foot injuries during manual handling of materials.	1. Workers should inspect materials for slivers, jagged or sharp edges, and rough or slippery surfaces. 2. Workers should keep fingers away from pinch and shear points, especially when setting down materials. 3. Steel-toed bots should be used for protection of the feet. 4. Routes should be surveyed for obstacles prior to moving materials from one location to another. 5. All three main factors in manual lifting (load location, task repetition, and load weight) must be considered when evaluating

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		what is safe or unsafe to lift.
12.       Unsafe conditions.	1.   All potential hazards.	1.   Where a situation presents a hazardous condition, the exposed employee will be removed from the hazardous area until all necessary precautions have been taken to eliminate the hazard and ensure their safety.